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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/871,431	05/31/2001	Hong-Sik Byun	TJK/180/L.W.	8882
26689	7590	10/15/2003		
WILDMAN, HARROLD, ALLEN & DIXON 225 WEST WACKER DRIVE CHICAGO, IL 60606			EXAMINER ZERVIGON, RUDY	
			ART UNIT	PAPER NUMBER
			1763	11
DATE MAILED: 10/15/2003				

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/871,431

Applicant(s)

BYUN ET AL.

Examiner

Rudy Zervigon

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 9-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 9, 10 require “connected in parallel”, and “plurality of antenna units being parallel-connected”, respectively. However, it is unclear if the antenna units that are “parallel-connected” are geometrically or electrically parallel-connected. Claim 11 claims “an impedance matching box connected in parallel with each other”. What is the impedance matching box connected to in parallel? Are the parallel connections of claim 11 geometrically or electrically parallel? It is assumed below that all parallel connections are electrical parallel connections.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 9 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Moslehi (USPat. 5,846,883). Moslehi teaches an RF power supplying apparatus including a plasma processing apparatus (Figure 22) having a vacuum chamber (620) for generating an inductively coupled plasma therein (column 3, lines 13-35; column 24, lines 15-67), comprising:

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- i. A very high frequency power source ("RF Power Supply"; Figure 25A; 630-632; Figure 22) that supplies a very high frequency power having a frequency of greater than 30MHz (column 24; lines 15-39; "RF Power Supplies")
- ii. an impedance matching box ("RF Matching Network (optional)"; column 27; lines 40-51) connected very high frequency power source
- iii. A plurality of antenna units (zone 1, zone 2...; Figure 25A) with a single "RF power supply" each comprising a coil antenna (see Figure), electrically connected in parallel, and receiving the very high frequency power ("RF Power Supply"; Figure 25A; 630-632; Figure 22) from the first very high frequency power source
- iv. An antenna (collected zones 1-3) comprised of a plurality of antenna units (zone 1, zone 2...; Figure 25A)
- v. The vacuum chamber has a reaction space (620) where the inductively coupled plasmas are generated by the plurality of antenna units (column 24; lines 29-30)

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-8, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moslehi (USPat. 5,846,883). Moslehi teaches a plasma processing apparatus (Figure 22) having

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a vacuum chamber (620) for generating an inductively coupled plasma therein (column 3, lines 13-35; column 24, lines 15-67), comprising:

- vi. A first very high frequency power source ("RF Power Supply"; Figure 25A; 630-632; Figure 22) that supplies a very high frequency power having a frequency of 20 to 300MHz (column 27; lines 40-51; column 24; lines 29-30)
- vii. A plurality of antenna units (zone 1, zone 2...; Figure 25A) being parallel connected with each other and receiving the very high frequency power from the first very high frequency power source
- viii. An antenna (zone 1, zone 2...; Figure 25A) being comprised of the plurality of antenna units
- ix. The vacuum chamber has a reaction space (620) where the inductively coupled plasmas are generated by the plurality of antenna units (column 24; lines 29-30)
- x. variable load capacitors ( $C_1$ ,  $C_2$ , ...; Figure 25A) connected to each antenna units (zone 1, zone 2...; Figure 25A)
- xi. an impedance matching box ("RF Matching Network (optional)"; column 27; lines 40-51) connected very high frequency power source and the antenna
- xii. a chuck (606; Figure 22) to mount a substrate (607; Figure 22)

Moslehi does not teach antenna units (zone 1, zone 2...; Figure 25A) comprising coils of a single turn.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the number of turns of the antenna units.

Motivation to optimize the number of turns of the antenna units is to optimize the induced RF voltage as taught by Moslehi (column 2, lines 46-67; column 3, lines 59-62). Further, it would be

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obvious to those of ordinary skill in the art to optimize the operation of the claimed invention (In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980); In re Hoeschele, 406 F.2d 1403, 160 USPQ 809 (CCPA 1969); Merck & Co. Inc. v. Biocraft Laboratories Inc., 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), cert. denied, 493 U.S. 975 (1989); In re Kulling, 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990), MPEP 2144.05).

### ***Response to Arguments***

7. Applicant's arguments filed July 28, 2003 have been fully considered and are not persuasive.

8. Applicant's position that a close reading of Moslehi "indicates that the power source only operates over a frequency range of 1MHz to 30MHz" is not convincing. Moslehi specifically states "(e.g., 1MHz to over 30MHz)" see column 24, lines 29-30.

9. Applicant's arguments based on the amendments filed with the response are independently addressed above in the body of the claim rejections.

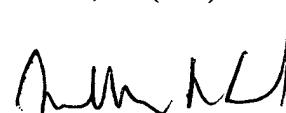
### ***Conclusion***

10. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this

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final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (703) 305-1351. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 7pm. The official after final fax phone number for the 1763 art unit is (703) 872-9311. The official before final fax phone number for the 1763 art unit is (703) 872-9310. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (703) 308-0661. If the examiner can not be reached please contact the examiner's supervisor, Gregory L. Mills, at (703) 308-1633.



JEFFRIE R. LUND  
PRIMARY EXAMINER